# Pikes Peak Children's Water Festival


# Student Workbook

Name: _____

**Unit #1 – Get to Know Your $H_2O$!**

## HOW MUCH WATER IN THE WORLD?

If 100 gallons represented all the water in the world, estimate how many of these gallons would be in each of the four distinct groups of water.

| How much water is: | 1st Estimation | 2nd Estimation | Actual Answer |
|---|---|---|---|
| Salt Water | | | |
| Frozen – Glaciers, ice caps, icebergs, etc. | | | |
| Groundwater | | | |
| Surface Water – Rivers, lakes, wetlands, clouds/vapor, etc. | | | |

- 1st Estimation – This is your own guess.
- 2nd Estimation – Now compare your guesses with a neighbor's guesses. Do you want to change any of your guesses? If you do want to change your guess, please enter your new answer in the 2nd column.
- Actual Answer - Now write down the actual answer that your teacher gives you.

**Unit #1 – Get to Know Your $H_2O$! (cont.)**

**Where Does Your Water Come From?** *Read this first, then answer the questions below:*

Communities in Colorado get their water from streams, lakes and reservoirs that are supplied by snowmelt and rainfall. The amount of water that is available for use varies from year to year and depends on snowpack in the mountains. In fact, about 80% of our water in town comes from snow that fell in the Rocky Mountains.

Everyone in the world lives in a watershed. A watershed is an area of land that drains into a stream or lake. Here in Colorado Springs we live in the Fountain Creek watershed which is part of the Arkansas River Basin. We use this water as part of the city water supply.

The Arkansas River Basin water available in town isn't enough for the size of our city so we also bring in water from the Colorado River and South Platte River Basins. In fact, most of our drinking water comes from 100 miles away from the Western Slope of the Rocky Mountains through a series of tunnels, canals and pipes. The water is stored in reservoirs before it is treated and distributed in our community.

A **reservoir** is a man-made lake used to store water.

By cleaning and testing the water, Colorado Springs Utilities makes sure that we have safe, delicious water for drinking. Our water utilities do more than clean the water. They also fix leaky pipes and install new ones, monitor water levels in our waterways and much more! The water used inside your house goes down the sanitary sewer drain to the wastewater treatment plant where it gets cleaned again.

1. What percent of our water comes from snow? _____ %
2. Write the name of the watershed you live in:

   _____
3. Name the three river basins that supply your water:

   _____

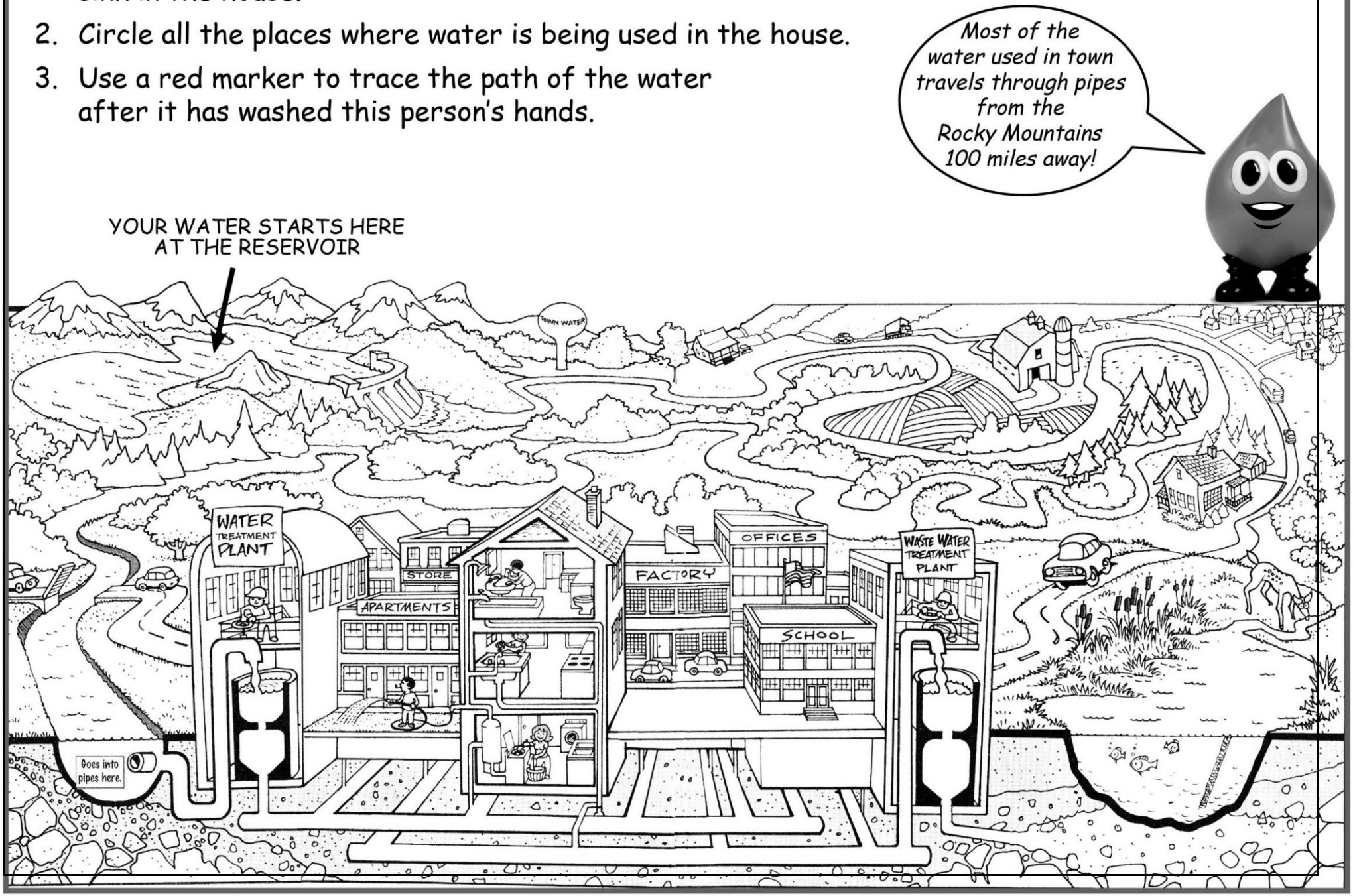
   _____

   _____
4. How far has some of your water traveled to get to town? _____ miles
5. What is the name of the utility company that supplies your drinking water?

   _____

# How Does Water Get to You?

1. Use a blue marker to trace the path of the water to the sink in the house.
2. Circle all the places where water is being used in the house.
3. Use a red marker to trace the path of the water after it has washed this person's hands.



**Unit #2 – Water Watchers**

It's Time to Test Your Water Sense! Think you know everything there is to know about water? You can't be sure until you test your Water Sense. *Circle your answers below. Use your teacher's answer key to see how many questions you answer correctly!*

1. When is the best time of day to water your lawn?

   A. Early morning or late evening
   B. In the afternoon
   C. All day long

2. How much water could you save by washing your bike with a bucket and sponge rather than letting the hose run?

   A. 1 gallon a minute
   B. 3 gallons a minute
   C. 4 gallons a minute
   D. 6 gallons a minute

3. Which of these ways to wash the car saves the most water?

   A. Wash it in the driveway with the garden hose
   B. Drive it into the lake
   C. Take it through a car wash that recycles water

4. How much water does a family of four (mom, dad, brother, and sister) use everyday?

   A. 50
   B. 100
   C. 250
   D. 360

5. True or False: It isn't important to save water because there is so much of it on Earth.

   A. True
   B. False

6. Stuck helping mom or dad wash the dishes? Which may use less water?

   A. Washing dishes by hand
   B. Washing dishes in a dishwasher

7. True or False: Keeping the water running when you brush your teeth wastes a lot of water.

   A. True
   B. False

8. Which of the following uses less water?

   A. Taking a 5 minute shower
   B. Taking a bath

9. Which of these everyday objects is a water-saving tool?

   A. A bucket
   B. A clock
   C. A broom
   D. All of the above

10. Which of these activities wastes the MOST water per day in the average home?

   A. Running the tap while washing dishes
   B. Using a garbage disposal
   C. A leaky toilet
   D. Long showers

11. True or False: It's okay to flush some trash down the toilet like cotton balls and tissue.

   A. True
   B. False

12. What should you do if you see or hear a leaky faucet in your house?

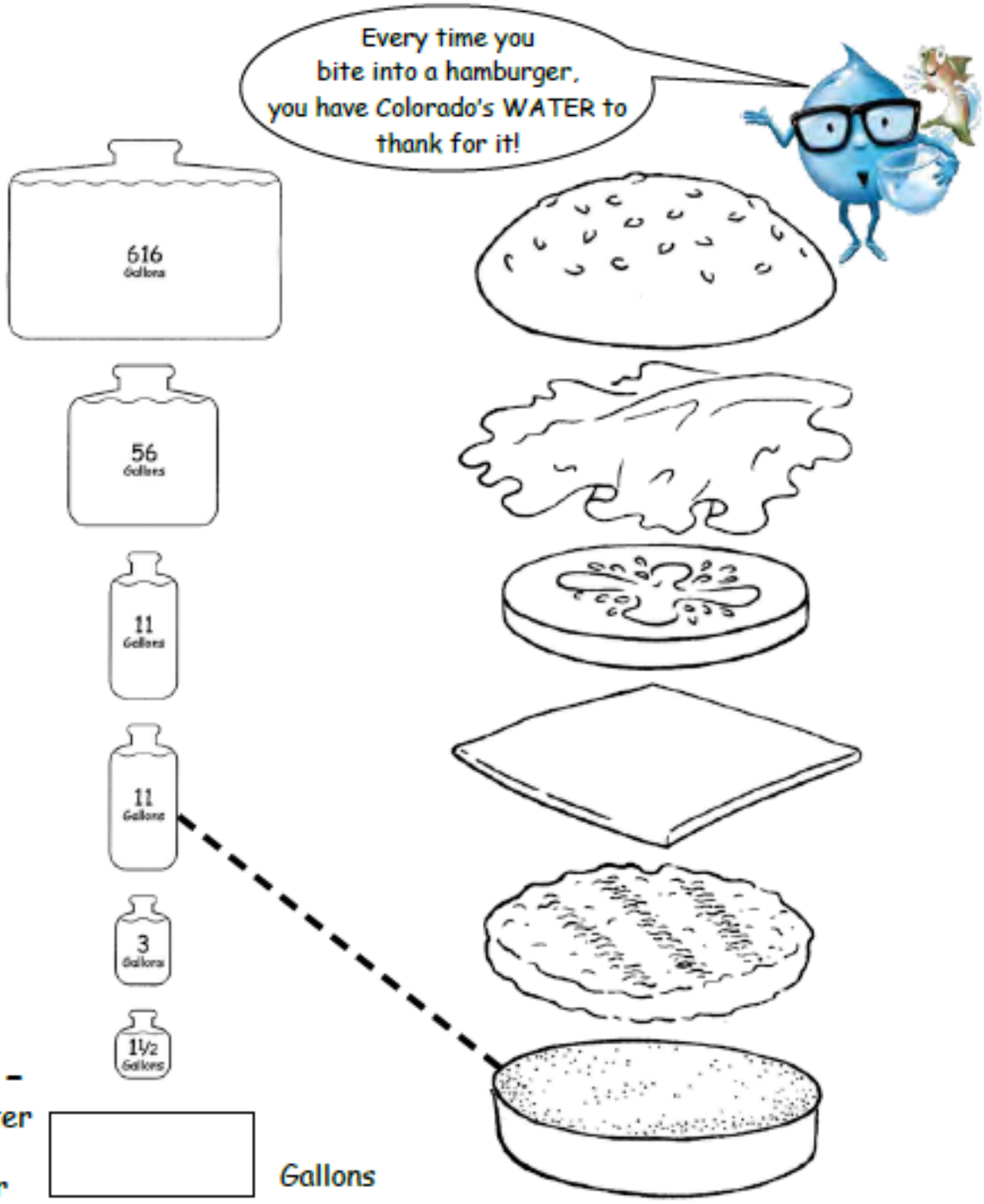
   A. Ignore it—drips are no big deal
   B. Do nothing—there is no way to fix a drippy faucet
   C. Tell your parents

**Unit #2 – Water Watchers (cont.) - What is a Water Footprint?**

Your water footprint is the amount of water you consume in your daily life, including the water used to grow the food you eat, to produce the energy you use and for all of the products in your daily life – your books, music, house, car, furniture and the clothes you wear.

# How Much Water is in Your Food?

Match up the ingredients on the right to the correct number of gallons it takes to grow or produce each. Then color your own burger!




**Add it up –**
How much water did it take to make your cheeseburger?

_____ Gallons

Source: California Department of Water Resources

**Unit #3 – Pollution Patrol**

*Read this first, then answer the questions below:*

**There are many ways water can get polluted**. Pollution is anything that can make the water unsafe or unhealthy such as trash, dirt and oil. Water does not only get dirty from people dumping directly into it. Things that happen in our everyday lives, far away from creeks, end up polluting our water.


The storm drains you see under the curbs on the street lead directly to creeks and streams. Each time the sidewalk and street get wet, pollutants such as litter, motor oil, pet waste, leaves, grass clipping, fertilizer and spilled chemicals wash down the storm drain. These pollutants make their way to our creeks and streams. You can help prevent pollution from getting into our creeks and streams.

1. Where do storm drains lead?

   _____

   _____

2. Who is responsible for reducing water pollution?

   _____

   _____

3. Think of three things you can do to reduce water pollution:

   a. _____

   b. _____

   c. _____

**Unit #3 – Pollution Patrol (cont.)**

| |
|---|
| Adjective = describing word<br>Verb = action word<br>Adverb = word ending in "ly"<br>Noun = person, place or thing |

Watershed-Libs

**Complete the following for hilarious results.**

*Enjoy trails at the Bear Creek Nature Center which follow the creek where you can observe wildlife and enjoy water!*

Last week, my friends and I took a hike to the _____ Creek near our city
(adjective)
of _____. The creek ran
(place)
through an open field and some _____ trees. It really was a
(adjective)
_____ place to see! After we
(adverb)
hiked along the creek, we decided to go _____ down the creek to learn more about the watershed. Some of
(verb ending in -ing)
the creek's flow is diverted into a reservoir that stores Colorado Springs drinking water. Some of those reservoirs offer a chance to _____! In the creek
(verb)
water we saw sediment that eroded from nearby hills. We also saw a _____
(noun)
floating in the water. We have to keep this water clean! There were small trout in the Creek and a _____ _____ on the shore. Suddenly we saw
(adjective) (animal)
_____ had _____ into the water. My friend discovered a
(proper name) (verb ending in -ed)
_____. We shouted: _____! We took it back to school to study
(natural object) (funny expression)
under a microscope. Creeks are always so much _____.
(adjective)

**Unit #4 – Water Wizard Facts**

*Write down your best answers then get into small groups with the answer key and see how well you did! During the Water Festival your class will compete with other classes to see which class can get the most answers right at the Water Wizard Challenge Station. The winning class gets a small prize.*

# Pikes Peak Children's Water Festival Water Wizard Facts

**General Water Trivia/ Water Cycle:**

| | | |
|---|---|---|
| 1 | True or false: the same amount of water exists on Earth today, as when Earth was first created. | |
| 2 | What is water composed of? | |
| 3 | What does the prefix Hydro mean? | |
| 4 | Name the three (3) physical forms of water. | |
| 5 | How much of the earth's surface is covered in water? | |
| 6 | How much of the water on earth is **usable** fresh water? | |
| 7 | How many pounds does a gallon of water weigh? | |
| 8 | What's it called when the body is lacking adequate fluids? | |
| 9 | About how much of the human body is composed of water? | |
| 10 | What is the name of the water cycle process by which water changes from a liquid to a vapor? | |
| 11 | What is the name for the portion of the water cycle where solid liquid falls to the earth's surface? | |
| 12 | What is the name of the water cycle process where water vapor changes to tiny liquid droplets and forms clouds? | |

| | | |
|---|---|---|
| 13 | What is the energy source that drives the water cycle? | |
| 14 | Precipitation can occur in several forms: Name three | |
| 15 | A type of precipitation is caused by raindrops passing through a freezing layer of air? | |
| 16 | What is another name for a drainage basin? | |
| 17 | What is water stored in an aquifer called? | |
| 18 | What is the alternate rise and fall of waters caused by the gravitational attraction of the moon and sun? | |
| 19 | Large rivers of ice that never completely melt are called? | |

**World and USA water facts:**

| | | |
|---|---|---|
| 20 | What is the longest river in the world? | |
| 21 | What is the largest lake in North America? | |
| 22 | What state is surrounded completely by water? | |
| 23 | What state claims to have 10,000 lakes? | |
| 24 | Which river cut the Grand Canyon? | |
| 25 | Which river system has had more impact on the development of the U.S. than any other? | |

**Colorado and CSU water trivia:**

| | | |
|---|---|---|
| 26 | Name the Colorado state fish. | |
| 27 | Most of Colorado's precipitation falls in which portion of the state? | |
| 28 | What is the significance of the Continental Divide as it relates to water? | |
| 29 | Colorado is unique in that 8 rivers originate within the state: Name our four largest rivers. | |
| 30 | From where does our drinking water originate? | |
| 31 | What is the average yearly precipitation in Colorado Springs? | |
| 32 | The Colorado River drains through seven states. Name three of them. | |
| 33 | What is a reservoir? | |
| 34 | What kind of energy is created by water flowing through turbines in a dam? | |
| 35 | Name the 3 river basins that supply water to Colorado Springs | |
| 36 | How many miles does your drinking water travel to get to Colorado Springs? | |
| 37 | When unwanted or dangerous substances get into our drinking water, we classify that water as? | |
| 38 | Why isn't it safe to drink water directly from Colorado's streams, rivers, and lakes? | |
| 39 | Where does our water go to be cleaned so that it is safe to drink? | |

**Ecology and water:**

| | | |
|---|---|---|
| 40 | What is xeriscape? | |
| 41 | What do we call plant and animal habitat near water? | |
| 42 | What organ do fish use to take oxygen from water? | |
| 43 | What group of animals spend a portion of their lives breathing using gills and a portion using lungs? | |
| 44 | What name is given to the bits of soil and rock that a river carries along and eventually drops to the bottom? | |

**Water use and conservation:**

| | | |
|---|---|---|
| 45 | On average, how many gallons of water a day does a Colorado Springs resident use? | |
| 46 | What is a drought? | |
| 47 | For what purpose is the most water used by an average Colorado Springs resident? | |
| 48 | Which two appliances inside the home use the most water? | |
| 49 | A high-efficiency toilet uses how many gallons of water per flush? | |
| 50 | How many gallons of water can you save by turning off the faucet while brushing your teeth and washing your hands? | |

**UNIT #5 – How Water Loss Affects Biodiversity**

How Water Loss Affects Biodiversity – *Read the passage to learn how the lack of water affects plants, animals and people, then answer comprehension questions to test your understanding.*

In order for humans to live, they need access to fresh water. Only .03% of the world's total water is accessible for humans to use for drinking. The small amount of potable (suitable for drinking) water makes its conservation incredibly important so that water shortages already occurring in some regions do not spread further. If they do spread, this may lead to conflicts over the right to use this water.

There are many ways in which humans can affect access to fresh water. For example, humans can pollute bodies of water, thereby making them undrinkable. In some cases, they may make physical changes to the land by building over wetlands or damming up rivers. While wealthy countries can afford to make the investments necessary to make sure their residents have access to fresh water, poorer countries often cannot. This means that poorer countries are at greater risk of devastating droughts, which can lead both to dehydration and starvation, as the country is unable to water its crops.

Droughts can also have a negative impact on the biodiversity of a region. Biodiversity refers to an abundance of different types of plants and animal species within a region. The prefix "bio" means living, while "diversity" refers to different types of things. Around the world, more than 125,000 animal species live entirely in freshwater habitats, including 15,000 species of fish 4,300 species of amphibians, and 5,000 species of mollusks, such as clams and oysters. Millions of other species, including humans, depend on fresh water to drink. When an area loses a large percentage of its fresh water, many animals die off. In some cases, species go entirely extinct. This leads to a decrease in the regions biodiversity.

In Africa, where droughts are common, they have been more prolonged than in the past. This is due in part to climate change, as well as a greater demand for water as the continent's population has increased. During a drought in Kenya that lasted from 2007-2009, over 60 elephants died-some of dehydration, others of starvation due to lack of vegetation to eat, and others of diseases that became fatal due to the elephants' weakened states. Some other endangered animals, such as the white rhinoceros, died too, which brought them closer to extinction.

When the biodiversity of a region declines, the human population suffers as well, in different ways. When a region experiences a significant drought, many animals many die from lack of water and food. If the region is one like Kenya, which depends on its wildlife to draw tourists, the effects of the drought can be devastating. If tourism declines due to high wildlife casualties, then

the locals who depend on the income from tourism will lose their livelihood. People may then turn to farming to earn money, but crops will require water to grow. This can place further strain on the water supply and worsen the original problem of the drought. Sometimes, an imbalance in the system, such as a lack of water, can enter into the feedback loop where the situation only gets worse and worse.

Losses in biodiversity can also lead to problems with the availability of food. As we've discussed, a lack of water can prevent farmers from growing crops, which can lead to starvation. However, when a region loses its biodiversity, it disrupts the food chain in many ways. For example, if a species goes extinct, all of the species used to feeding on it must find another source of food. Say a population of freshwater frog dies because its habitat has been depleted in a drought. This means the population of birds that feeds on this frog may decline as well, as it lacks sufficient food. Conversely, the insects that the frogs fed on may increase in number, as the frogs are no longer around to keep their population in check.

One of the many advantages of biodiversity is that there are certain natural processes that plants and animals perform that humans simply cannot. The billions of bees in the world play a critical role in pollinating the world's flowers. If they did not do this, the food supply would dwindle, and the human population would suffer greatly.

Biodiversity can play an important function in the cleaning of water. When water passes through lakes, wetlands, and streams, it often encounters different species of fungi, algae, and bacteria. Many of the microbes actually filter microscopic particles out of the water, making it safe for humans to drink. Even some larger species do similar work. For example, the caddisfly constructs nets underwater that filter out different kinds of particles, which it then eats. Wetlands rich with these underwater organisms act as natural water filtration systems. When the biodiversity of a region declines, many of the organisms critical to this filtering process can disappear. Therefore, pressures on the freshwater supply can cause biodiversity to decrease, which can cut the drinkable water supple even further.

While humans do have some water filtration plants, these plants are expensive and take a lot of energy to maintain. For centuries the water that flowed into New York City was naturally filtered by a northern watershed. As the water flowed south, it was purified. However, as the watershed was polluted and diverted, the water flowing to New York City was no longer filtered. The city faced a choice of spending $6 billion to $8 billion to build a water filtration plant, or just $1 billion to restore the natural watershed. The city wisely chose the latter option.

**Unit #5 – How Loss of Water Affects Biodiversity COMPREHENSION QUESTIONS**

1. What is biodiversity?

2. The cause of humanity's increased water consumption is an increased population. What is the effect?
   A. Less potable water, a growing threat to biodiversity
   B. More potable water, a growing threat to biodiversity
   C. Less potable water, a decreased threat to biodiversity
   D. More potable water, a decreased threat to biodiversity

3. What is this passage mostly about?
   A. The effects of water loss on biodiversity
   B. The drought in Kenya from 2007-2009
   C. The distribution of the world's fresh water
   D. The effects of population growth on the water supply

4. Read the following sentences: "Say a particular species of freshwater frog dies because its habitat has been depleted in a drought. This means the population of birds that feeds on this frog may decline as well, as it lacks sufficient food. Conversely, the insects that the frogs fed on may increase in number, as the frogs are no longer around to keep their population in check."

   What does the word "conversely" mean?
   A. In the same vein
   B. For this reason
   C. As an example
   D. On the other hand

5. Choose the answer that best completes this sentence: Humans can affect access to fresh water in many ways, _____ polluting bodies of water and building dams.
   A. Finally
   B. Such as
   C. Initially
   D. Although

6. What makes the conservation of fresh drinking water so important?

7. Describe a problem caused by losses in biodiversity.

8. How might humans help prevent losses in biodiversity? Use information from the passage to support your answer.

Source: ReadWorks